WHAT IS CLAIMED IS:

1.   An image processing apparatus for generating information that allows to detect a position of tampering for an original image which is formed of first and second regions, comprising:

feature image generation means for generating a feature image of the original image using an image of the first region;

watermark information generation means for generating watermark information which contains the feature image and information associated with the original image;

error-correction encoding means for generating error-correction encoded watermark information by making error-correction encoding of the watermark information; and

output means for outputting, as an output image, an image formed by replacing image information of the second region in the original image by the error-correction encoded watermark information.

2.   The apparatus according to claim 1, further comprising:

encryption means for encrypting the watermark information generated by said watermark information generation means, and

wherein said error-correction encoding means makes error-correction encoding of the watermark information encrypted by said encryption means.

5 3.   The apparatus according to claim 2, further comprising:

reordering means for reordering a bit sequence which forms the error-correction encoded watermark information, and

10   wherein the bit sequence of the error-correction encoded watermark information is reordered by said reordering means.

4.   The apparatus according to claim 1, further
15 comprising:

Hash value calculation means for calculating a Hash value using the image of the first region, and

wherein said watermark information generation means further stores data of the Hash value in the
20 watermark information.

5.   The apparatus according to claim 1, wherein the information associated with the original image contains a bit sequence used to check if the watermark
25 information is normally decoded.

6.   The apparatus according to claim 5, wherein the bit sequence is a Hash value for a part of the watermark information that contains at least the feature image.

5

7.   The apparatus according to claim 1, wherein the information associated with the original image contains information used to specify a process for generating the feature image.

10

8.   The apparatus according to claim 1, wherein said feature image generation means generates a plurality of feature images of the original image by executing different feature extraction processes.

15

9.   The apparatus according to claim 1, wherein the feature image is a partial image of the original image.

10.   An image processing apparatus for detecting a
20   position of tampering in a tampered image which is formed of first and second regions, comprising:
        error-correction decoding means for making error-correction decoding of an image based on the second region to reclaim watermark information which
25   contains a feature image that represents a feature of the tampered image before tampering, and information

associated with an image before tampering of the

tampered image;

feature image generation means for generating a

feature image of the tampered image using an image of

5   the first region; and

tampered position notifying means for notifying

the position of tampering in the tampered image using

the feature image which is contained in the watermark

information and represents the feature of the tampered

10   image before tampering, and the feature image of the

tampered image.

11.   An image processing apparatus for generating

information that allows to detect a position of

15   tampering for an original image which is formed of

first and second regions, comprising:

encryption means for encrypting watermark

information, which is generated in advance, to generate

encrypted watermark information;

20   error-correction encoding means for making

error-correction encoding of the encrypted watermark

information to generate error-correction encoded

encrypted watermark information; and

output means for outputting, as an output image,

25   an image formed by replacing image information of the

second region in the original image by the

error-correction encoded encrypted watermark
information.

12.   An image processing apparatus for detecting a
5   position of tampering in a tampered image which is
formed of first and second regions, comprising:
        error-correction decoding means for making
error-correction decoding of an image based on the
second region to generate an error-corrected image
10   based on the second region, so as to reclaim encrypted
watermark information;
        decryption means for decrypting the encrypted
watermark information to reclaim watermark information;
        watermark information verification means for
15   verifying consistency of the watermark information; and
        tampered position detection means for, when the
watermark information meets the consistency, detecting
a tampered position by comparing the image based on the
second region and the error-corrected image based on
20   the second region.

13.   An image processing method for generating
information that allows to detect a position of
tampering for an original image which is formed of
25   first and second regions, comprising:

a feature image generation step of generating a feature image of the original image using an image of the first region;

a watermark information generation step of

5 generating watermark information which contains the feature image and information associated with the original image;

an error-correction encoding step of generating error-correction encoded watermark information by

10 making error-correction encoding of the watermark information; and

an output step of outputting, as an output image, an image formed by replacing image information of the second region in the original image by the

15 error-correction encoded watermark information.

14. An image processing method for detecting a position of tampering in a tampered image which is formed of first and second regions, comprising:

20 an error-correction decoding step of making error-correction decoding of an image based on the second region to reclaim watermark information which contains a feature image that represents a feature of the tampered image before tampering, and information

25 associated with an image before tampering of the tampered image;

a feature image generation step of generating a
feature image of the tampered image using an image of
the first region; and

a tampered position notifying step of notifying

5   the position of tampering in the tampered image using
the feature image which is contained in the watermark
information and represents the feature of the tampered
image before tampering, and the feature image of the
tampered image.

10

15.   An image processing method for generating
information that allows to detect a position of
tampering for an original image which is formed of
first and second regions, comprising:

15   an encryption step of encrypting watermark
information, which is generated in advance, to generate
encrypted watermark information;

an error-correction encoding step of making
error-correction encoding of the encrypted watermark

20   information to generate error-correction encoded
encrypted watermark information; and

an output step of outputting, as an output image,
an image formed by replacing image information of the
second region in the original image by the

25.   error-correction encoded encrypted watermark
information.

16.   An image processing method for detecting a
position of tampering in a tampered image which is
formed of first and second regions, comprising:

an error-correction decoding step of making
5   error-correction decoding of an image based on the
second region to generate an error-corrected image
based on the second region, so as to reclaim encrypted
watermark information;

a decryption step of decrypting the encrypted
10   watermark information to reclaim watermark information;

a watermark information verification step of
verifying consistency of the watermark information; and

a tampered position detection step of detecting,
when the watermark information meets the consistency, a
15   tampered position by comparing the image based on the
second region and the error-corrected image based on
the second region.

17.   A program for making a computer function as an
20   image processing apparatus of claim 1.

18.   A program for making a computer implement an
image processing method of claim 13.

25   19.   A computer readable storage medium storing a
program of claim 17.

20.   A computer readable storage medium storing a
program of claim 18.

CFM03401US / P203-0545US